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To: Agriculture Water Use Efficiency
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Subject: productivity of applied water

AgWUE:

The contentious Productivity of Applied Water (PAW) supplemental indicator is intended to inform interregional comparisons of long term averages of the amounts of water necessary to achieve competitive yields. However, there is agreement that the time to attain dependable averages will be lengthy. Additionally, the value of such comparisons will be limited by inability to act on the information without unprecedented interference with the ability of growers to respond to price signals. It is suggested an approach be adopted which will produce information that is more likely to be actionable, yet retains the water productivity concept.

The request by the Senate to craft a recommendation for evaluating water use efficiency presents a rare opportunity to advance a research agenda that will serve the interests of the agricultural sector, while enabling comparisons similar to those PAW advocates desire. Rather than inform comparisons between regions directly, a more productive project would produce comparisons of yields¹ as a function of irrigation levels. Maximal yields are frequently not the most water efficient yields and yields do not decrease at a constant rate with decreasing irrigation, so crop specific optima in terms of marketable yield per unit of water are often positioned at a point below maximal yields. Heroic effort would be required to develop this information from new field research, but extensive published information and data exist to support modeling with several software packages. The interested reader is referred to FAO's [AquaCrop](#) and articles published in special issue 101:3 (2009) of the [Agronomy Journal](#). Numerous other models are available, for this has been an active research topic for a considerable time.

Much of the information on yield under suboptimal conditions is scattered across crop production function literature. To assemble the data and earlier modeling results to produce unified models for various crops would be a significant contribution, and one which may serve growers well as demands on the state's water supplies increase and as supplies grow increasingly erratic. Knowledge of maximally water efficient irrigation levels for various crops may increase the resilience of the agricultural sector when challenged by drought. PAW advocates would have access quickly to comparative efficiencies for the some of the regions. The section dealing with productivity of applied water in the draft Methodology could be edited to reflect such a shift in approach without much effort.

Most models have provision for partitioning evapotranspiration into ET_c and evaporation. Partitioning has been requested by several participants on the A1.

Regards,
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